

REMARKS

Applicant has amended Claims 1, 6, and 7, and has cancelled Claims 2, 4, and 17. Applicant has also added new Claims 21-26. For the reasons given below, all of the pending claims are believed allowable.

The present invention is a catalytic combustor which includes channels that are coated with catalyst, and channels that are uncoated. The coated channels are designated "hot" channels, and the uncoated channels are designated "cold" channels. In one aspect of the present invention, the hot channels located near the inlet end of the combustor include a thermal barrier, which prevents heat from flowing from the hot channels to the cold channels. The thermal barrier thus promotes "light-off", by preventing heat from "leaking" from the hot channels to the cold channels in the light-off (inlet) zone.

Another aspect of the invention is the use of an additional coated strip, in the hot channels in the light-off zone. The additional coated strip enhances combustion in the hot channels in the light-off zone, both by providing additional catalyzed surfaces in that zone, and by creating a larger number of smaller, catalyzed channels. More importantly, the additional strip is coated on both sides, thus providing a surface that has no place for heat to leak away. The latter feature contrasts with the other surfaces in which a coated strip has an uncoated surface on its other side.

Both of the above features of the invention are recited in the pending claims, and are discussed in more detail below.

1. The Thermal Barrier

The Examiner asserts that a thermal barrier is suggested by the prior art, and cites U.S. Patent No. 5,512,250, column 13, lines 13-18, for its teaching of a non-catalytic barrier layer.

However, the '250 patent describes only a diffusion barrier. Note that the passage of the '250 patent, cited by the Examiner, refers to U.S. Patent No. 5,232,357, also of record in this application. The '357 patent describes the diffusion barrier in more detail.

A diffusion barrier is a layer placed over the catalyst. A diffusion barrier slows down the gas molecules, inhibiting their diffusion to the catalyst. A diffusion barrier is not a thermal barrier.

A thermal barrier is an insulating layer that tends to prevent heat from flowing from one region to another.

Thermal barriers, per se, are common, for example as used on gas turbine blades. But Applicant is aware of no reference that teaches the use of a thermal barrier to manage heat flow in a catalytic combustor. The reference cited by the Examiner on this point clearly does not teach or suggest a thermal barrier.

Applicant has amended Claim 1 to include the limitations of original Claim 2. Thus, Claim 1 now recites that the heat transfer inhibiting means comprises a thermal barrier. For this reason, Applicant submits that Claim 1 defines a patentable invention over the references.

Claims 2 and 4 have been rendered redundant by the amendment to Claim 1, and have therefore been cancelled.

Claims 3 and 5-7 depend from Claim 1, and are therefore also believed allowable.

The other claims which include the limitation of a thermal barrier are

Claims 8-10, 13-16, and 18-20. These claims are believed allowable for the same reason given above with respect to Claim 1.

2. The Additional Coated Strip(s)

The present invention also includes additional coated strips, positioned in the hot channels in the light-off zone, as illustrated for example in Figures 4 and 5. The additional strips are in phase with, and of lesser amplitude than, the primary corrugated strip defining the hot channel. As noted above, the additional strips are coated on both sides.

The term "in phase" means that the strips have their maxima and minima at the same respective points on a horizontal axis, as is shown in Figures 4 and 5 of the present application. The phase relationship is necessary to preserve the integrity and identity of the hot channels. If the strips were not in phase, a hot channel would not remain a hot channel. Moreover, the amplitude restriction is necessary to enable the additional strip to divide the hot channel into smaller channels that are approximately comparable in cross-sectional area, as is clearly shown in Figures 4 and 5.

The Examiner asserts that the "additional strip" of the present invention is shown or suggested by Figure 4 of the '250 patent. A closer examination of the present claims reveals that the claimed feature is not shown in the cited reference.

Figure 4 of the '250 patent shows a large straight corrugated strip 42 in a "cold" area, and a pair of smaller, non-nesting herringbone-corrugated strips 44 in the combustion area. One can determine the "hot" and "cold" areas by the presence or absence of catalyst coating 50.

Claim 11 of the present application recites that the "channels" are defined by the "primary corrugated and flat strips", and that the additional strip has corrugations in phase with, and of lesser amplitude

than, corrugations of the primary corrugated strip. Claim 11 also recites that the additional strip divides each coated channel into more than one coated channel.

It is not clear, from the Official Action, which strip of the '250 patent has been identified, by the Examiner, with which element of the pending claims. But it will be shown below that, regardless of how one interprets the '250 patent, the result is that Claim 11 cannot be read on the reference.

Suppose first that the strip 42 having large corrugations, as shown in the '250 patent, is identified as the "primary corrugated strip" of Claim 11. The "additional strip" required by the claim must then be the lower strip 44, because the claim requires that the additional strip have a catalyst coating. The language of the claim is clearly not met because the additional strips 44 are not in phase with strip 42. The strip 44 does not have the same period as strip 42, and its maxima and minima do not coincide with those of strip 42. In fact, strip 44 often has maxima where strip 42 has minima, and vice versa.

Moreover, and more importantly, the additional strip 44 does not affect the channels defined by strip 42. Therefore, additional strip 44 cannot be said to divide the channels (which are defined by strip 42) into more than one channel. Furthermore, the channels defined by strip 42 are not even coated with catalyst, as is required by Claim 11.

Thus, under the above hypothesized interpretation, Claim 11 could not be read on Figure 4 of the '250 patent.

Suppose now that one of the strips 44 is identified as the "primary corrugated strip" of Claim 11. Then the language of the claim is still not met, because one of strips 44 is clearly not of lesser amplitude than that

of the other strip 44.

Thus, regardless of how one interprets Figure 4 of the '250 patent, Claim 11 cannot logically read thereon. Although Figure 4 of the '250 patent shows many strips, both coated and uncoated, and of different sizes, it does not show or suggest the specific structure that is claimed in Claim 11.

Applicant therefore submits that Claim 11 defines patentably over the references. Claim 12 depends from Claim 11, and is therefore also believed allowable.

A similar analysis can be applied to Claim 21. The "additional strip" of Claim 21 could only be identified with the bottom strip 44 of the '250 patent, because that is the only corrugated strip that is coated. But since the "channels" of Claim 21 are defined by the primary corrugated strip, the "primary corrugated strip" in Figure 4 of the '250 patent could only be one of the strips 44. Clearly, the corrugations of strip 44 are not of lesser amplitude than the corrugations of strip 44.

Thus, an attempt to read Claim 21 on Figure 4 of the '250 patent leads to an illogical conclusion. Applicant therefore submits that Claim 21 is allowable.

The conclusions reached above are not merely the result of word play, but are the consequence of the fact that the present invention differs fundamentally from the structure shown in the '250 patent. The '250 patent shows strips of different sizes, located in different regions of the combustor, but it does not show "hot" channels, defined by a corrugated strip, in which an additional corrugated strip divides the hot channel into smaller channels.

New Claims 22-26 depend, respectively, from Claims 3, 9, 11, 20, and 21, respectively. These new claims recite that the additional strip is

coated on both sides. As explained above, this feature tends to prevent heat from leaking away, because the additional strip does not have an uncoated (cold) side. Also, this feature clearly further distinguishes patentably over the '250 patent, which does not show an "additional strip" that is coated on both sides.

Claims 6 and 7 have been amended only to provide antecedent support for the recitation of the "additional strip".

Applicant has considered the other references, cited by the Examiner but not applied to the claims. Applicant believes that none of these references discloses or suggests the present claimed invention.

For the reasons given above, Applicant submits that all of the pending claims define a patentable invention.